JANUARY, 1961

THE AIR LINE PILOT

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JANUARY, 1961

Vol. 30, No. 1

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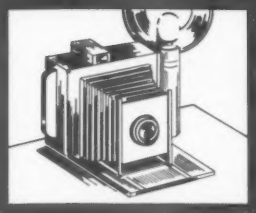
On The Cover

UN WE BELIEVE '66

Photograph courtesy American Airlines

Close-up of two of jetfans powering American Airlines' 707 Astrojets, points up the oversized cowling which covers the forward fan section of the advanced power plant. One of the distinguishing features of the Astrojet, the engines are about two feet longer than conventional jets and about a foot wider in diameter up front because of the fan. "Astrojet" is the name adopted by the airline for its airplanes powered by highly advanced "fan-type" engines. The 707 Astrojet is said to be the fastest commercial airplane. It will cruise well in excess of 600 mph, or about 40 mph faster than the airline's standard 707.



The ALPA Camera

Some Highlights and Sidelights of the News and ALPA in Pictures

American Airlines Photo

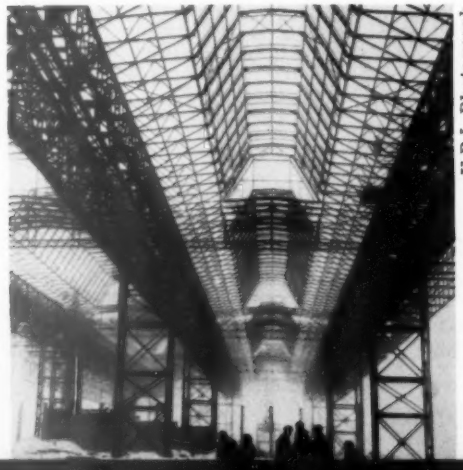
Helicopters of New York Airways are now using the AA terminal as its base of operations at Idlewild.

Two more Link jet flight simulators have won FAA approval for use in flight crew training according to an announcement by the Link Division. Pictured is the one used by UAL for DC-8 training. Second simulator is used by NAL for training Electra crews. Link jet simulators are the only ones thus far to win FAA approval.—Link Aviation Photo.

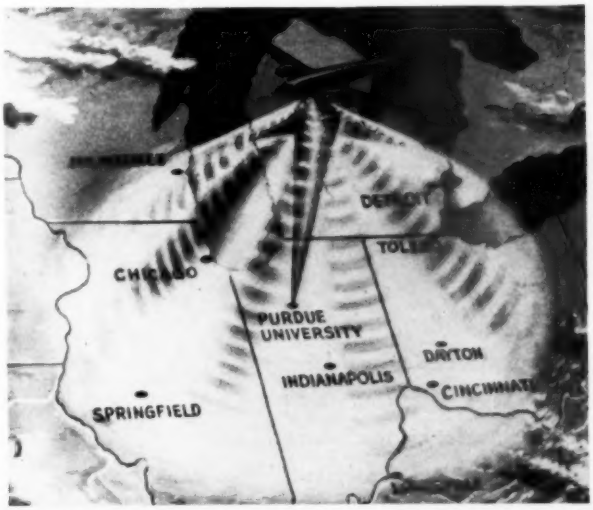
U.P.I. Photograph

AA 707 which skidded and plunged through snowbank while landing at Logan airport, December 17, 1960.

Steel framework of hangar at Domodedova —near Moscow—will make field one of the largest in the world and larger than all present Moscow airports combined.



U.P.I. Photograph



School children in six states area are getting their science lessons relayed from airborne TV transmitter.

Composite photograph—not an actual incident.

INCIDENT REPORTING AS AN AID TO FLIGHT SAFETY

by CAPTAIN DAVID HALPERIN
Supervisor of Flight Safety
Trans World Airlines, Inc.

Incident reporting, whether near-misses or mechanical mal-functions, can make a significant contribution to air safety if the information is gathered and analyzed. This article tells how TWA handles their incident reporting program.

AT LAST YEAR'S International Flight Safety Foundation Air Safety Seminar Mr. George Wansbeek, Deputy Head, Safety Department of KLM Royal Dutch Airlines, pointed out how little carriers know of each others activities in the field of incident investigation.

I heartily agree with him and feel the lack of interchange of information in this respect hinders progress in the achievement of higher industry safety standards.

TWA's Incident Program

For well over a year, my own air line has administered through its operations department a highly successful program of incident reporting and analysis in which both pilots and managements might be interested. Our experience indicates the program has a number of creative features and is capable, with modification to suit individual administrative procedures, of being adopted by other air line operators. We also feel the program offers an approach to profitable accident prevention through highlighting situations and circumstances which might otherwise be neglected. We believe sufficient experience with the program has been accumulated to be able to bring it to you with its benefits and shortcomings, and I must add we consider the benefits to be considerable and such shortcomings as exist to be mainly those arising from lack of utilization.

In any consideration of the necessity or desirability of incident reporting it would be appropriate to dwell on U.S.A.F. philosophy. I do not recall anyone stating the proposition so well, and I gladly run the risk of being trite to recall General Caldera's remarks on the subject. Certainly, this philosophy parallels our own thinking on TWA.

"Aircraft incidents are a prelude to an aircraft accident. These words may not appear to be profound, but when fully evalu-

ated they most certainly are. It is a known fact that a direct relationship exists between the occurrence of incidents and the occurrence of accidents.

Unfortunately, the exact numerical value of this relationship is not known; however, it is reasonable to assume that a certain number of incidents precedes (in some form or other) every aircraft accident. And my definition of incident is anything that causes the aircraft or crew to deviate from normal. Call it what you may—mishap, unusual occurrence, episode, reportable or nonreportable incidents—they all mean the same in the accident prevention business.

To my way of thinking, the aircraft incident is one of the best warning devices we have, at the present state of the art, for preventing aircraft accidents. When everyone concerned fully realizes the accident potential inherent in aircraft incidents, and appropriate corrective measures are taken before an accident happens we will have accomplished a major breakthrough in accident prevention."

General Joseph D. Caldera, USAF

We will all agree, I think, that incidents, by their very nature tend to be the private part of the business of the operating agency whether the agency be military, commercial operator, business aircraft operator, or private airplane owner. Consequently each air line, and we are primarily looking at the air line side of things, for the moment, brings to the problem an approach most suited to its policies and internal administration.

Whereas the air force can devote men and attention to probing every instance of deviation from normal or routine, this approach may very well be beyond the ability or interest of a private business enterprise. This is not to cast aspersion on the air force criteria established for incident investigation, but rather to suggest everyone must accommodate their efforts to their own philosophies and abilities.

In TWA our interest is expressed in terms of the following philosophy: Accidents, or incidents, involving damage injury is indicative that our policy is broken down. Their investigation and analysis is for the purpose of finding the cause and initiating action to prevent future accidents of a similar nature. The TWA Flight Operations Department is charged with the responsibility of efficient completion of our published schedules. Efficiency in this respect can be measured by the completion of our daily schedules without alteration, delay, or cancellation. An incident, or accident resulting in damage equipment or injury to person compromises our ability to operate efficiently.

This then, provides the impetus for our interest in incidents and the development of a program designed to evaluate their importance as well as providing a means for thorough investigation and analysis.

Analysis of Incidents

Most air lines appear to follow more or less similar practices in setting up boards of inquiry, accident investigation teams, committees to handle recommenrations, and instituting procedures to prevent recurrence. On TWA we like to think we have gone one step further in instituting our Critique Boards to probe beyond the confines of formal investigation.

The reasoning and necessity for this can be expressed by citing an example: An emergency descent and non-scheduled landing is made because of the failure of an outer windshield panel. Under normal investigation there would undoubtedly be disclosure of the nature of the mechanical failure, the pilot and crew actions taken, subsequent passenger handling, etc.

Most of this information would be obtained from written crew statements, engineering and maintenance reports, and reports from the ground station involved. Would these written reports reveal the factors which often can only be brought to light through informal discussion? The effect of the noise of the window cracking on the pilots immediate reactions? The degree of assistance and cooperation provided by ATC? The immediate action of the passengers in the cabin, and their thoughts and actions at the sudden, unexpected appearance of the oxygen masks from the overhead? The effectiveness of the PA System in suppressing passenger anxiety? The minor difficulties encountered in using approved emergency procedures? The Captain's knowledge or ignorance of window strength factors?

Standard Procedure Followed

It was with these and other questions in mind that the following policy was adopted by the Flight Operations Department of TWA:

Establishment of Critique Boards

1. Experience to date has shown considerable value can be derived from informal discussion of incidents not of such nature as to require full accident investigation. It has been shown that quite frequently there is but a difference of degree between an incident and a serious accident.

2. To insure a full and complete understanding of such incidents, and further, to explore all facets surrounding the circumstances of these incidents, the following critique procedures are to go into effect immediately.

A. Determination of the Necessity of Establishing a Critique Board.

In general, when an incident occurs that could possibly result in an accident should conditions have deteriorated beyond the actual conditions of the incident, the Domicile Safety Representative directly concerned shall within five days of the date of the incident set up a meeting of the critique board and shall so advise the Flight Safety Supervisor by dispatch.

B. Composition of Critique Boards.

The composition of critique boards shall be:

(1) The entire crew, including cabin attendants.

(2) Representatives of all organizations representing the crew.

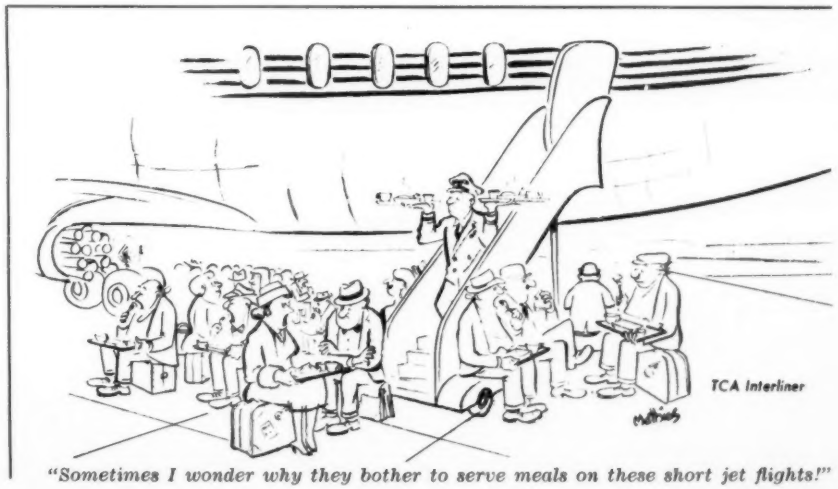
(3) The Flight Safety Supervisor or his designated representative.

(4) Representatives of all departments concerned with the incident.

(5) A designated representative of the maintenance establishment.

C. Conduct of the Critique Board.

The critique shall be conducted verbally and in an atmosphere of complete informality.



"Sometimes I wonder why they bother to serve meals on these short jet flights!"

Note taking shall be kept to an absolute minimum and such notes shall be taken only by the Flight Safety Supervisor or designee.

Assurance shall be given that the critique is purely a fact-finding session and no statements in writing shall be asked for or received. Minutes of the critique will not be written or published, however, such remedial programs of action subsequently taken shall be monitored by either the Flight Safety Supervisor or Domicile Safety Representative, and a report shall be made to the remainder of the board concerning the establishment and progress of these remedial actions.

Results from Reports

Coincidentally with the adoption of our critique and review procedure, we developed and put into effect a line pilot reporting procedure as an integral part of the over-all flight safety program. In the eighteen months of its operation there have been processed well over one hundred reports dealing with every phase of airline operations.

These have included such conditions as less than standard separation because of altimeter variance on our mountain to desert routes, ATC clearance and procedures, excessive glare under windshields, cargo loading and handling, near misses, similar flight number of different airlines arriving at the same terminal around the same time, and improvements in existing techinques and procedures. In practically all cases processing of these reports has led to improvements, and in no instance has a pilot complained because of inattention to his report.

The program works, and works well. There is some additional administrative effort required to meet processing requirements, but the advantages more than outweigh the time and manpower expended. Morale of the pilot group has been enhanced by having an avenue for "letting off steam"; the adoption of a standardized procedure has all but eliminated the excessive volume of correspondence between management and individual pilots regarding their particular problem; and a number of situations of interest to management have been brought to its attention in brief, factual, and substantiated form allowing for investigation with a maximum of efficiency.

Form Pilot Uses

The heart of the program is the form used. Of distinctive color, these forms are distributed to every line station and are readily available throughout the system. They carry full instructions for both the pilot and the processing department, but perhaps the best way to illustrate this is to review the standards set up for submission of a report:

"TWA Captains have a responsibility to correct unsafe, potentially hazardous conditions and to stop dangerous procedures when he can, but if he can not, he should alert the people who can best take steps leading to corrective action. The Line Pilot Report is a positive means of bringing a potentially unsafe condition to the attention of the agency responsible for remedial action.

Line Pilot Reports serve as a vital source of information for the prevention of potential accidents. It is the heart of the accident prevention program, for without adequate knowledge it is impossible to correct deficiencies which go on unnoticed and unknown.

A review of these reports will provide data as to the extent and the area of potentially dangerous situations. This will allow us to take more effective and appropriate action to correct deficiencies in these specific areas. These trends toward future possible accidents will be more quickly noted and allow preventive measures to be taken.

The attached form has been prepared to provide a simple, convenient, and most important, an automatic method of providing the data from which information can be gathered that will allow for specific preventive measures to be taken to lessen the accident potential."

After receipt of this report, discussions are held with Flight Research and Development, Training, and Flight Operations Departments. Should action be indicated, a memorandum is drafted to the appropriate department, and implementation is under way.

It is hoped that this presentation of our procedures will give you an understanding of how TWA benefits from incidents which normally are treated so casually as to preclude remedial benefits.

"A Coward Loses Fear Aboard Jet"

By Patricia McComack, UPI Columnist, Re-printed by permission

This aeronautical coward has just made her maiden voyage across the Atlantic in a jet plane. Like many women afraid of flying, I expected the shakes at take-off, clenched teeth during the flight—and everything terminating in a crash.

How silly can one woman be?

While climbing aboard and taking what I fully expected to be my last look at Idlewild Airport, I considered myself daring—and foolish—to have allowed myself to be talked out of taking a parachute and hatchet along.

"People would think you blotto," my husband said, "they might even laugh."

Lament Over

The minute I stepped into the plane, the lament over the do-it-yourself survival kit vanished. Good interior design apparently is an airborne coward's best friend. I was so busy admiring the interior of the cabin that I missed the chance to bite my nails at take-off. I didn't even remember to cross my fingers.

The plane was decked out in red, white and blue. The curtains covering the windows were candy striped in red and white. The seats reminded me only of the softest in the lobby of the Waldorf. And the piped-in music was a Swiss waltz.

I missed the chance to bite my nails at take-off for several other reasons. One hand tightly held the beverage of my choice. The other was loaded with reading material the stewardess presented.

Discovery: when you get to 30,000 ft. and higher, the stars twinkle more.

Laughter, Sleep

Soon my eyes were twinkling, too—the kind of twinkle you get when you laugh at yourself.

I was laughing over being scared. Sleep followed the laughter—and eight hours after that, came a nudge from the stewardess. It was breakfast call. And breakfast included filet mignon.

In one hour we were down in Zurich—exactly at the time and in the manner the pilots anticipated. First lesson from one aeronautical coward: have faith in the pilots.

STATEMENT REQUIRED BY THE ACT OF AUGUST 24, 1912, AS AMENDED BY THE ACTS OF MARCH 3, 1933, AND JULY 2, 1946 (Title 39, United States Code, Section 233) SHOWING THE OWNERSHIP, MANAGEMENT, AND CIRCULATION OF

The Air Line Pilot, published monthly at Chicago, Illinois, for Oct. 1, 1960.

1. The names and addresses of the publisher, editor, managing editor, and business managers are: Publisher, Air Line Pilots Association, International, 55th St. and Cicero Ave.; Editor Ed Modes, 55th St. and Cicero Ave. Managing editor, None; Business manager, None.

2. The owner is: Air Line Pilots Association, 55th St. and Cicero Ave.; Clarence N. Sayen, President; S. W. Hopkins, First Vice President; Robert L. Tuxbury, Secretary; D. J. Smith, Treasurer, all of 55th St. and Cicero Ave.

3. The known bondholders, mortgagees, and other security holders owning or holding 1 percent or more of total amount of bonds, mortgages, or other securities are: None.

4. Paragraphs 2 and 3 include, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting; also the statements in the two paragraphs show the affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner.

5. Average monthly circulation for the year 1960: 19,530.

(Signed) ED MODES, Editor.

Sworn to and subscribed before me this 1st day of October, 1960.

(Seal) GLYN R. JOHNS
(My commission expires Feb. 17, 1964)

Veteran pilot promoted to ass't oper. manager

Captain Quigley

Captain Paul J. Quigley, one of Eastern Air Lines' veteran line pilots and check captains, has been promoted to Assistant Operations Manager for the company's activities at LaGuardia Airport, New York.

A native of Clifton Springs, New York, Captain Quigley graduated from Ithaca College in 1940, and taught for a year at the Andover, New York, High School, and served in the Army Air Corps from 1942 to 1945 as an instructor and flight commander.

He joined Eastern as a pilot in January, 1946, at New York, and has been based in this area since then. He was promoted to Captain in 1952 and to check captain in 1956.

Captain Quigley lives in East Brunswick, New Jersey, and has been active in various community affairs there, including the Kiwanis Club, of which he is a director; and the Budget Committee of the United Fund of New Brunswick.

UAL pilot running for civic office post

ptain Stefanki

Captain John X. Stefanki of United Air Lines is a candidate for the office of Assistant Supervisor of York Township, Du Page County, Illinois. This is Stefanki's first venture in politics and he expects a vigorous campaign in the approaching April elections.

Captain Stefanki is serving as Safety presentative, vice-chairman of the gislative Committee, and Chairman the Public Relations Committee for ALPA Council. He is also a member the UAL-ALPA Speech Panel.

He has been a pilot for UAL since 46. He received his flight training in e Navy and received his commission in 1943. He flew as a Navy night fighter instructor and fighter bomber pilot. He was in the Naval Reserve program for 8½ years.

He is married and has seven children. The family resides in Villa Park, Illinois.

Northwest MEC looking for "crew of the year"

A "Crew of the Year" Award, sponsored by the North Central Master Executive Council's Professional Standards Committee will be presented shortly to crews selected as the most deserving in each domicile.

The goal of the Award is to commend those crew members who demonstrated excellence in their performance of duty during the last year. They will be judged on appearance, professional bearing, personality, public conduct, industry, cooperation, loyalty, initiative and conduct.

Physical formation of a "crew" for award purposes will consist of a captain, first officer and stewardess and determination of the winners will be made solely by local Professional Standards Committees with advisory participation by the base supervisors.

The 1960 award will be made in Minneapolis by the company at a date to be announced in the near future.

Establishment of the award was cited by NOR's pilot group as another effort in continuing program to maintain and improve the professional concept of pilots and stewardesses.

Delta presents service awards to veteran pilots

Delta Air lines has presented awards to seven pilots for their length of service with the Company. These include: Captain C. Robertson, 20 years. Captain J. S. Tiffany, Captain R. N. Waller, Copilots, C. A. Gibson, G. L. Phillips, and G. H. Miller, 15 years.

EAL employees make record contribution to UFD

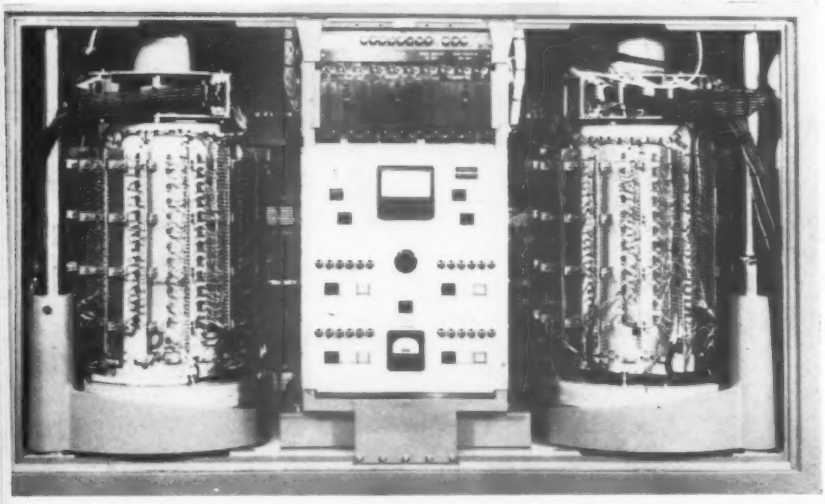
Through contributing $117,328 to their 1961 United Fund Campaign, Eastern Air Lines employees in Miami once again gave more to the United Fund than the employees of any other firm in the State of Florida. It was the 11th consecutive year that EAL's employees have "copped" the state-wide giving title. In addition to Over-all Campaign Chairman Jay McGlon and I. A. of M. Lodge No. 702 President Tom Shields, pictured (from left to right) are the following Campaign Chairmen and Co-Chairmen: Harry Bissell, Pilots (A.L.P.A.); Sam Edwards, Mechanics, Stock Clerks, etc. (I. A. of M.); Shields; McGlon; John Rafferty, Flight Attendants (A.L.S.S.A.); Frank Griffen, Administrative Employees and Agents; T. P. Tootle, Mechanics, Stock Clerks, etc. (I. A. of M.), and Joe Rembisz, Flight Engineers (F.E.I.A.). —*Photo courtesy The Machinist Weekly*

AUTOMATION IN AIR TRAFFIC CONTROL

by E. W. PIKE, Air Traffic Management Division
General Precision Systems Limited, London, England

Automation has become a necessity if the air traffic control system is to keep up with high speed jets and the growing volume of traffic. In this interesting article, and expert describes how air traffic control will evolve from a completely manual operation to a fully automatic system some time in the future.

Photograph courtesy Librascope Division, Glendale, California



Data processor unit in a semi-automatic air traffic control system under study at the FAA experimental center, Atlantic City, which reduces controllers' clerical work freeing them for decision-making.

PROPHECY about aviation is rather an unrewarding activity, but I feel it reasonably safe to express belief that the human Air Traffic Controller will carry out his control functions very much as he does today for as long into the future as it is safe to peer. In this age of gadgetry, automation consciousness and elaborate systems complexes, this may seem rather a bold assertion. However, few engineers would disagree with the statement that designing a servo-mechanism as complicated, as efficient, and generally as reliable as man is well beyond our present state of knowledge. Besides, mass production is reasonably economical, relatively simple and universally popular!

The working environment of the Controller is, of course, comprised of information displays concerning traffic position and plans, and he is at present linked with the situation through a speaker or the cord of his communications headset, through which emanates a constant stream of demands. Some of these are anticipated but occasionally in emergencies they are entirely unexpected. In his work, the phrase "real time" is much more than computer jargon. Few if any decisions can safely be deferred until less important tasks have been completed. Furthermore, decisions relating to individual aircraft can rarely be made without considering

their repercussive effect on other traffic and the whole pattern must be reviewed to plan the action that best suits any given situation.

Human vs. Machine Decisions

Nevertheless, man of course has limitations and the superior ability of electronic computers to store masses of data and perform intricate calculations with lightning speed and accuracy is unquestionable. These faculties unfortunately tend to foster in some quarters beliefs that human controller functions will soon be replaced and phrases such as "automatic Air Traffic Control systems" are beginning to be used. Yet how can one incorporate in any electronic assembly invaluable qualities such as a feeling of responsibility, a sense of urgency, a recognition of patterns or the capacity for improvisation? Computers, for all their amazing work capacity, have absolutely no fear of death.

The Air Traffic Control services of the world have had to be developed and expanded very rapidly because of the necessity for preserving air safety. They are based on mutual trust between the pilot and the Controller that each is carrying out his job efficiently in accordance with an established set of rules. The pilot is responsible for planning, executing and, where necessary, varying his flight. The Controller observes the flight pattern in his area of responsibility, predicts the movement of aircraft therein and, when necessary to avoid a conflict of separation criteria, intervenes with amended clearances or instructions.

This sounds simple, but whether you watch a pilot operating in a busy terminal area or a Controller supervising traffic flow therein, it is difficult for the layman to avoid a sense of wonder that, like Oliver Goldsmith's schoolmaster, one small head can carry so much knowledge. If by any chance you are in a profession that requires at least a passing knowledge of a Controller's mental gymnastics, you may already have learned with some surprise that the methods they use almost defy precise definition. Should anyone doubt this, I suggest they ask an experienced radar controller to put down in precise order the mental steps he takes in reaching decisions.

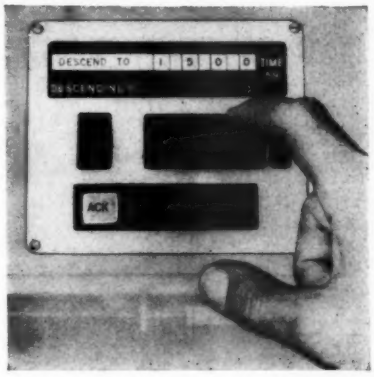
ATC Technical Trend

Everybody is of course aware that to avoid overloading Controllers in the future, and to cope with increased and more diverse traffic, the Air Traffic Control service has to be improved. Much can be done with modern equipment to assist the Controller with his housekeeping duties and most of the improvements now being developed, tested or implemented are for that purpose. It seems likely that developments in Air Traffic Control Centers will follow an orderly course, probably along the following lines:

Reliability Factor

In broad terms it may be stated that the ability of the Controller to handle more traffic with tranquillity of spirit can be increased by better data handling, high speed computing services, more suitable and flexible situation displays and more efficient communications. In all these aspects a very high standard of reliability in any equipment provided is absolutely essential. One should remember, nevertheless, that equipment failure at some time or other should be deemed inevitable and therefore due regard must be paid in systems design to the consequences of failure. It is also necessary to give a great deal of thought to creating in the Center an atmosphere in which Controllers can work in a natural and relaxed fashion. Expecting maximum efficiency in surroundings that sometimes generate considerable noise, minimum light and require far too much physical movement on the part of the Controller is highly optimistic.

Push-button communication



A push-button air traffic communications display is being developed by Lear, Inc., for the Federal Aviation Agency. Lear's Airborne Insertion-Display Equipment (AIDE) is a cockpit display portion of FAA's Automatic Ground-Air Communication System (AGACS). AGACS is intended to reduce voice communication, which is saturating the existing channels as air traffic increases.

Both incoming and outgoing messages are displayed on the Lear Airborne Insertion - Display Equipment. Messages composed of letters and numbers reading from left to right in natural syntax will be presented on a single 4½ in. by 5½in. display panel. The instrument will be capable of displaying 64 separate words and phrases, which coupled with four additional number-and-word readouts, offers an almost infinite number of message variables. Color coding will differentiate incoming from outgoing messages and a selective memory function will provide pilot and controller with the last message received on their respective displays.

E OF SYSTEM	DATA	DISPLAY	DISPLAY	CONFLICTS	CONFLICT	AIR/GROUND
FULLY MANUAL	TRANSFER	PREPARATION	UPDATING	DETECTION	RESOLUTION	COMMUNICATION
PARTLY MECHANIZED	VOICE	MANUAL	MANUAL	CONTROLLER	CONTROLLER	VOICE, ETC.
MACHINE ASSISTED FLIGHT PLAN PROCESSING	TELEPRINTER ETC.	" STRIP	" "	" "	" "	" "
SEMI-AUTOMATIC	"	PRINTER	AUTOMATIC F/P BOARD	"	"	"
SEMI-AUTOMATIC WITH CONFLICT DETECTION	" "	" "	"	COMPUTER	"	"
FULLY AUTOMATIC	"	"	"	"	COMPUTER	DATA LINK

AUTOMATION IN AIR TRAFFIC CONTROL

(Continued from preceding page)

Controllers seem to have much in common with pilots in being initially distrustful of innovations. It is imperative that their acceptance of and trust in new equipment is obtained before it can be properly utilized. If any design feature is weak it will soon be obvious and its acceptance by Controllers retarded, in fact following the proverb "once bitten, twice shy" they may subsequently be much harder to convince that the basic idea or the specific device is any good.

Evolutionary Changes

In my personal opinion major advances in air traffic control will come from a revision of methods rather than the introduction of radically new techniques. These may be generated by an eventual realization that to operate aircraft efficiently we must give some thought to organizing an integrated four-dimensional Air Traffic Control service based on efficient flight planning. A measure of freedom from the slavery of fixed and arbitrary separation criteria is surely worth an effort and could be achieved when aircraft are able to navigate accurately in three dimensions instead of two. Electronic computers have no difficulty whatever in calculating potential conflicts between, for example, ascending and descending aircraft crossing each other's path, provided such aircraft can maintain predetermined flight profiles and specified air speeds with reasonable accuracy.

When an acceptable area coverage navigational system is linked to accurate altitude measuring ability in the aircraft, so that the pilot can be given means for following accurately any vertical profile within the aircraft's performance capacity, I believe we can anticipate spectacular improvements in Air Traffic Control. When one considers that within comparatively few years we may have supersonic aircraft, VTOL aircraft and helicopters all joining in the mad scramble to depart from and arrive at community centers at popular times, the development of this three-dimensional navigation ability seems to be of the utmost importance.

Human Perspective

I expect that air space users, like other transport operators, will eventually agree that there is nothing inherently objectionable in a reasonable and necessary measure of flight discipline. Certainly we do not want control for control's sake, and it is to be hoped that the intelligent deployment of new air traffic control equipment will facilitate the utmost flexibility in the use of air space. Nevertheless, I believe that any attempt to organize large volumes of traffic on the basis of everybody's right to fly where, how, and when they choose would result either in the Air Traffic Control service being swamped or incarcerated in an electronic jungle.

The traffic controller carries a heavy load of responsibility for safety, and unless anybody is brave enough to suggest that this responsibility be vested in a tangle of transistors, we must be very careful not to place the man in the impossible position of sensing but being unable to take the necessary action to avert catastrophe.

Finally I believe that the introduction of automation in Air Traffic Control will be effected in a spirit of humility and with acceptance of the fact that the existing organization works, however inadequate it may appear theoretically, and cannot tolerate major disruptions involved by providing Controllers on a given date with very different basic tools. Improvements should be effected in logical steps and after proper investigation into whether the action proposed is solving a real problem in the right way, i.e. it does not create a host of new problems for that invaluable basic component in Air Traffic Control—the experienced, competent human traffic Controller.

Weather briefings on closed circuit TV

The Weather Bureau, U. S. Department of Commerce, is now operating a closed circuit television system at New York International Airport to provide weather briefings for international flights.

The use of closed circuit television will help the Weather Bureau meet the aviation industry's need for forecasting and advisory service over a wide range of routes and at the higher altitudes flown by jets. It is an important part of the Bureau's continuing effort to make use of modern automatic methods to make available complete and up-to-the-minute weather data and to keep pace with rapidly changing aviation needs.

Pilots and crews can now obtain a complete weather briefing at their own convenience by visiting the TV briefing facility, where a continuous map display and discussion is always in progress. The television monitor at New York International Airport (Idlewild, is the Weather Bureau Briefing Office in the International Arrivals Building. The map displays, cameras and transmitters are located in the International Aviation Forecast Section, Hangar 11, Idlewild. Hangar 11 is approximately one mile from the Briefing Office and the Terminal City area.

The televised briefing consists of a series of weather charts, accompanied by the taped commentary of a Weather Bureau forecaster. The charts depict the anticipated wind and weather conditions at levels from the surface to approximately 45,000 feet, covering the major international routes. The briefings are changed every six hours and can be modified more often as conditions make it necessary.

Each complete televised briefing is subdivided into two area briefings. The first portion of the briefing is directed at flights departing for the Canadian Maritimes, Iceland, Western Europe and the Azores; utilizing locally prepared weather charts. The second portion of the briefing is tailored for flights to Bermuda, the Caribbean and Central and South America; utilizing charts prepared by a similar Weather Bureau forecast unit in Miami, Florida. These Miami charts are received at Idlewild, within minutes after their completion, via facsimile transmissions.

The equipment was designed and manufactured for the Weather Bureau by General Precision, Inc., of Pleasantville, New York.

The televised Weather Bureau briefings will aid both fliers and forecasters. Some pilots, in the past, have had to depend on telephone descriptions of weather charts. They will now be able to see the charts themselves. They will have a fuller picture of weather conditions than might be obtained by a telephone call to the forecaster. Also pilots will be saved several miles of ground travel to get a briefing based on visually available weather charts. In turn, the aviation weather forecaster can now reach a larger pilot and dispatch audience with a single briefing and will be free to devote more time to the analysis of new weather developments.

Similar systems are being installed by the Weather Bureau at Miami, Fla., and San Juan, Puerto Rico.

Alan S. Boyd, Chairman, Civil Aeronautics Board, discusses:

A LOOK TO THE FUTURE OF DOMESTIC CIVIL AVIATION

Chairman Alan S. Boyd, Civil Aeronautics Board, testifying at a hearing of the Senate Aviation Subcommittee.

There are many problems to be considered in predicting the future of domestic civil aviation. I face this task with some trepidation because it is always bad to leave a record showing how wrong your predictions can be. Nonetheless, let us look at some of these problems and attempt to project a future for the domestic civil aviation industry.

We are faced with the regular re-equipment programs of the common carrier industry which correspond closely to the rhythm of labor pains. There have been a number of such re-equipment programs since the end of World War II. Consider now, for example, that although turbojet aircraft are the new additions to our civil aviation fleet, there is a concerted effort to create a design and bring about construction of a supersonic transport. It is apparent from this that the union in civil aviation of private enterprise and government regulation has not yet borne its first child.

This article is based on a speech made by Chairman Boyd before the Fourteenth Air Transportation Institute, Washington, D. C., November 18, 1960.

History of Expansion

The history of civil aviation in the United States is one of constant expansion. In 1932 the number of aircraft in scheduled domestic air line service was 456. At the end of 1959 this number had increased to 1,596, including helicopters. The aircraft added to the fleet have increased their cruising speed from 120 miles an hour to over 600 miles an hour, and their capacity from an average of about 15 passengers per plane up to an average of about 140 passengers per plane. This constant growth and expansion has brought about a corresponding increase in productivity with a resultant beneficial effect on air fares.

For example, in 1932, the first-class air fare between New York and Los Angeles was $160.00. The same fare in 1960 had increased to only $181.00, including a $10.00 jet surcharge. Again in 1932 the Chicago-New York fare was $47.96, which has increased to $50.15 on piston-engine aircraft and $53.15 on jet aircraft.

Compare these really minor increases in air fare with the cost of purchasing and operating an automobile in 1932 as against 1960. Compare these increases with the difference in the cost of bread, coffee or any of the essentials of life. Transportation is certainly such an essential. One can have only admiration for the tremendous job that management and labor in the aviation industry have been able to accomplish through the intervening years.

While there has been this constant improvement in design and productivity in the aviation industry, considerable doubt is expressed whether regulation has kept pace with these giant strides. Our more sympathetic critics do not believe we know what we are doing; and others have unkind things to say about us in regulation. Rather than debating or defending the wisdom of regulation, let us explore together a few avenues leading to the future in the hope we may gain some perspective of what will be the future of domestic civil aviation in the United States. In order to do that, it seems to me we should adopt a frame of reference for the future and describe it as that time intervening between the present and the scheduled operation of a supersonic transport which I expect to see by 1970.

More Mergers Ahead

The trunk carriers represent the most well-known segment of the civil avia-

(Continued on following page)

This article to use the Chairman's pun, "represents a 'Boyd's eye' view of the future of domestic civil aviation." First, he reviews the tremendous gains made in civil aviation since 1932. But in this decade he predicts mergers and consolidations among the trunk carriers. Next, he thinks the CAB ought to review the situation of local service carriers which he believes should be given more flexibility in their operations. He calls for a definite liason between the CAB which has the problem of authorizing service with accompanying subsidy and the FAA which administers the expenditures of airport aid funds. He foresees a great expansion in the use of helicopters in short-haul operations and commuter traffic carried by helicopters. Air cargo carrying is also due for rapid growth. And, he points out, the future pattern of civil aviation will depend to a considerable extent on Congressional action.

A LOOK TO THE FUTURE OF . . .

(Continued from preceding page)

tion industry, and it does not seem necessary to cover their background in order to give you my reasons for propecting their future. At the present time the trunk carrier industry is composed of twelve air lines. It is my belief that the trunk industry has pretty well stabilized its equipment program. The present generation of turboprop and turbojet aircraft will dominate until the advance of the supersonic transport. There will probably be additional turbojet designs for short and medium-range operations by the trunk carriers.

While the equipment of the trunk carriers has been stabilized, I do not think the carriers themselves have stabilized. It is to be expected that additional mergers and consolidations will be sought. When the supersonic transport does arrive, there will not be sufficient long distance air passengers going in the right directions to support twelve carriers operating these aircraft. Although there were twelve Apostles and eggs are sold by the dozen, there is really nothing magic about the number twelve. The goal of government regulation is regulated competition, and so long as hard-driving competition is actually provided the number of competitors is relatively unimportant. My reference to mergers and consolidations is in the role of a prophet rather than that of an advocate.

The Local Service Carriers

Let us turn now to the situation of the local service carriers. These were variously known in the beginning as feeder or local service carriers. They were certificated by the Civil Aeronautics Board beginning shortly after World War II, on an experimental basis. The purpose was to provide service to communities smaller than those then receiving scheduled air line service from the trunk carriers. The Board realized that subsidy would be required to maintain these operations. Since it did not know how much public benefit would be derived from this new type of service, all certificates were issued on a a temporary basis. The Congress decided the matter of public interest by providing in 1955 that local service carrier certificates should become permanent rather than temporary.

Apparently interpreting the Congressional action as an indication of a public desire for expanded local service, and also because of prior experience with the carriers, the Board undertook an expansion of the existing route structure of local service carriers. The result is that today these carriers are authorized to serve 482 different points in the United States, of which they serve exclusively 283 authorized points. This service is divided up among some thirteen carriers, which results, as you can imagine, in a very extensive network of air routes throughout the country.

The local service carriers have operated with the *sine qua non* of the DC-3 aircraft. While the DC-3 has been, or is the workhorse of the local service industry, all of the carriers have, or are now in the process of coverting from the DC-3 to faster pressurized twin-engine aircraft.

It does seem clear to me that the traveling public are entitled to the use of pressurized equipment this day and time, provided they are willing to pay a reasonable price for its use. Such equipment is much more expensive to operate and requires higher depreciation charges than the DC-3, although the speed and capacity of this equipment are much greater than that available on the DC-3. It is not now economically feasible to operate even DC-3's over many of the short stages the local service carriers must operate The mileage requirements for economical operation of the newer equipment are even greater.

The local service carriers have been limping along with miserable earnings records. This is one of the many areas where regulation has been criticized for not keeping up. It is manifest that this situation cannot continue. A reasonable showing of profits with reasonable reg-

(Continued on page 14)

A biographical sketch of the new FAA administrator

Najeeb E. Halaby, Los Angeles attorney and financier, has been appointed to the post of Administrator of the Federal Aviation Agency by President John F. Kennedy.

Halaby succeeds E. R. Quesada who retired as Administrator to take over the franchise of the American League's new Washington baseball team.

The new Administrator has his own law firm in Los Angeles, N. E. Halaby & Associates. He is also secretary-treasurer of Aerospace Corporation, technical advisors to the Air Force ballistics missiles and space program. A private pilot since 1933, Mr. Halaby was also a test pilot for Lockheed Aircraft from 1941 to 1943 and a U. S. Navy test pilot from 1943 to 1946. As a Navy lieutenant in 1945 he flew the first transcontinental jet flight.

From 1948 to 1954 he was Deputy Assistant Secretary of Defense for International Security and in 1953 received the Arthur Flemming Award as the outstanding young man in Federal service. As vice-chairman, under William B. Harding of the White House Aviation Facilities Study Group from 1955-1957, Mr. Halaby helped pave the way for the establishment of the Federal Aviation Agency. He is a member of the Board of Directors of the Flight Safety Foundation, Society of Experimental Test Pilots and Quiet Birdmen.

In announcing the appointment of Halaby, President Kennedy stated "During the next few years, one of the most challenging jobs in the federal service will be to minimize the perils of the air space and to go forward in developing the great prospects for aviation."

Najeeb E. Halaby

He added that the job called for a "highly qualified and professionally competent" man and that it was felt that Mr. Halaby would best fit the requirements. Halaby will report directly to the President and will be his principal aviation advisor.

A native of Dallas, Texas, Halaby, 45, received an A.B. from Stanford in 1937 and an LL.B. from Yale University Law School in 1940. He is a member of the California, District of Columbia and Supreme Court Bars.

During the recent campaign, Mr. Halaby was a member of the Board of Directors of the Southern California Citizens for Kennedy and Johnson.

NYU seminar on air transport economics, March 27-31

The first of a series of seminars on international air transport, "The Economics of Air Transportation, will be held March 27 through 31 at New York University's Washington Square Center.

The seminar is being sponsored by NYU and the International Transport Institute. Directing the seminar will be Dr. Jacob Schenkman, an international aviation consultant, research director of ITI, and adjunct assistant professor of transportation at NYU.

"This will be the first seminar of its kind in the United States," Dr. Schenkman said. "New and critical economic problems for the management of air transportation have been created by the introduction of jet aircraft on national and international air routes. Among the factors to be considered is the increasing use of air transportation in the developing economies of new countries. Members of the seminar, under expert guidance, will evaluate techniques designed to improve the economic position of airlines."

NY helicopter service links heliports with AA terminal

Helicopter service linking American Airline's passenger terminal at Idlewild directly with area heliports served by New York Airways has been announced jointly by the two transport firms. Service will begin on January 23, 1961.

IFRAA elects Loyd Fuller new president at meeting

Mr. Loyd Fuller was elected President of the International Rescue and First Aid Association at IFRAA's 13th Annual Convention held in Philadelphia, Penn., recently. All of the elected officers serve as volunteers for one-year terms as do the more than 100 other appointed officers who serve on state and provincial levels in the U. S., Canada and other countries.

During the Convention, rescue and first aid contests were staged with trophies being presented to the top teams in their respective categories. ALPA and ALDA jointly sponsored the presentation of trophies to the winners of the first International rescue competition. First place went to the Dominion Ridge Emergency Squad from Montreal, and second to the Hennespin County Sheriff's Rescue Squad, Minneapolis, Minnesota.

The 1961 Convention has been scheduled for November 2-4 at Roanoke, Virginia.

AA's 707s two year traffic equals four of piston era

According to American Airlines, their 707's have reached traffic totals in two years that previously took four with piston airliners. For example, in two years AAL's 707's carried 2,780,000 passengers and have flown a total of 4,800,000,000 passenger miles. By comparison it takes American's piston equipment nearly four years to accumulate the same traffic totals.

UAL passenger, freight, mail, hits all time peak in January

Passenger, freight and mail volumes of United Air Lines in January were the highest ever flown by the company in that month, according to estimated figures reported by Robert E. Johnson, senior vice president-sales and advertising.

During January United flew 491,465,000 revenue passenger miles, an increase of 34 per cent over the same month a year ago.

Other monthly totals were 7,164,000 freight ton miles, up 35 per cent over January, 1960; 3,833,000 ton miles of mail (including first class) for a rise of 67 per cent; and 996,000 express ton miles, up 26 per cent.

Half of UAL stewardesses in training were 20 years old

More than half the girls who entered United Air Lines stewardess training in 1960 were 20 years old, according to a company survey.

Of 792 trainees, 427 young women or 54 per cent had not reached their 21st birthday. Next were 21-year-olds, with 166 girls or 21 per cent.

Training classes were attended by 105 girls who were 22 years old, or 14 per cent, and 38 girls 23 years of age, or 5 per cent. The remainder were in the 24-26 age range.

Forty-seven per cent of the trainees in 1959 were 20 years old, and only 34 per cent in 1958.

The average stewardess candidate in 1960 was 21.5 years old, 5 feet 5 inches tall, weighed 118.5 pounds and had completed 1.5 years of college training. Prospective stewardesses must be 20 years old but not yet 27, and between 5 feet 2 inches and 5 feet 8 inches, with proportionate weight.

JET OVERHAUL CENTER: Newest view of the huge maintenance base at San Francisco where UAL overhauls its fleet of more than 200 aircraft shows several additions for jet aircraft maintenance. Identified by numbers (1) warehouse; (2) jet engine test cells; (3) jet engine overhaul plant; (4) piston engine test cells; (5) jetliner overhaul dock; (6) piston engine overhaul plant; (7) piston engine aircraft docks; (8) offices and sheet metal shop.—UAL Photo.

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A LOOK TO THE . . .

(Continued from page 12)

ularity must become an accomplished fact. The institution of fast pressurized aircraft will not of itself bring about much improvement.

The carriers must have the right to extend the distance between landings. Maybe what I am saying here is that assuming we can work out our subsidy problems, the management of local service carriers must have more flexibility in their operation. This cannot be done, however, to the detriment of the existing pattern of service provided by the trunk carriers.

The CAB has undertaken a gradual program to authorize skip-stop or non-stop authority so the local service carriers may be able to extend the distance of individual flight operations. This has proved to be of benefit. Carrier management feels, however, that the Board has not yet sufficiently relaxed its restrictions.

Federal Airport Aid

Numerous communities are constantly seeking scheduled air line service and some are certainly entitled to receive a quantum of this service. A factor that must be considered here is the continuing federal airport aid program which will certainly extend into the future. Broadly speaking, the terms of this airport aid program are that the federal government will provide approximately 50 per cent of the cost of construction of airports in designated areas. The community or local governmental unit puts up the balance, usually through the sale of general obligation or revenue bonds. It is certainly reasonable for the citizens in these communities where airports are being constructed with the air of federal money to suppose that the same federal government will authorized and require scheduled air service once the construction has been completed.

Unfortunately, there is no procedure for liaison in this area between the CAB, which has the problem of authorizing service with accompanying subsidy, and the Federal Aviation Agency, which administers the expenditure of airport aid funds. There should be a definite liaison between the two agencies in this area. In the meantime, I fear that there shall be disappointments at the community levels in the future because the Civil Aeronautics Board is not going to be able to authorize service to every community that wants it.

It is entirely possible the local service carriers will evolve an operation similar to that performed by our regional trunks several years back. This will include longer hauls connecting metropolitan areas within each company's system as the trunks gradually move out into their own longer haul markets. It will include a pattern of minimum service to those communities showing a need for such service, yet not able to provide incentives for a multiplicity of schedule. An allied event will be the gradual withdrawal of both local and trunk service within a radius of about 100 miles of large metropolitan areas due to the expense involved in short-haul operations. My prediction is that the helicopter or VTOL/STOL aircraft will cover the area within this circle.

More Helicopters

With the growth of the megalopolis or giant city that is projected for numerous areas in the United States, I expect to see an air-bus operation with helicopters or VTOL/STOL aircraft operating in a manner similar to the urban transit systems we have in all of our major cities today.

Some of the foremost municipal planners are convinced that the area between Boston, Richmond and Norfolk, Virginia, will be one tremendous metropolis. I have seen no dissenters to this idea. This is certainly the trend, and when the time comes, I expect to see local air-buses and express air-buses going from area to area on a regular schedule with passengers purchasing commuter or single-fare tickets to move from one place to another.

There are many unanswered problems that go with such a development, not the least of which is the increased level of noise from the air-bus operation that is bound to create problems in suburban residential areas. Other problems have to do with the design of the aircraft, the financing of the aircraft, that is whether private or governmental capital, and the timing of the operations as to when they should begin.

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another question that must be answered is whether it is in the public interest for the government to provide financial assistance to such an operation if it is to be privately owned.

In this connection, I do not feel that it will be possible for any government to pave the whole East Coast area in concrete or macadam. This would be necessary to provide sufficient highways and parking space for private automobiles, unless some other form of transportation, such as I have outlined, comes into being.

The helicopter and VTOL/STOL are still in infancy. It is to be expected that their costs of operation will decrease while reliability and productivity are on the rise. As I have pointed out, the costs of operating conventional fixed-wing aircraft, particularly in the local service field, are increasing, thereby limiting severely their possibilities in the short-haul market.

It is also my belief that greater emphasis will be placed on feeder services as a method of bringing passengers to central gathering points. There they will board long-range nonstop flights of the large jet aircraft. These services will be provided by local service carriers with conventional aircraft and by helicopter or VTOL/STOL aircraft.

I am convinced the trunk carriers will utilize a large part of their remaining piston fleet for cargo operations and that these operations will be vigorously promoted. More and more businesses are beginning to realize the value of central warehousing and limited inventories.

The all-cargo carriers will make great strides with new aircraft specifically designed for cargo movement. The CL-44, the Argosy, and the Hercules do not appear to be the final answer to the requirement of the all-cargo carriers. They do, however, represent a very substantial intermediate step in the right direction. The joint efforts of the trunk and all-cargo carriers to promote the transportation of cargo is bound to create a much greater public awareness which will result in an increasing flow of cargo through the air.

Congressional Action

So much depends on future Congressional action in the field of supplemental carriers that no one is able to make a prediction. My belief is that the supplemental carriers as a class will continue to operate. However, I do not know whether their sphere of activities will be more in the domestic field or the international field, and I do not know the extent to which they will be transporting military traffic. Once Congress enacts a statute dealing with the supplementals, the Board will then be able to implement the policy set forth in the statute.

Regulation has had many problems with which to contend in the past few years. We have had to deal with the problems brought about by the rapid transition from piston to jet aircraft, we have undergone a series of Congressional investigations which required considerable time on the part of regulatory personnel. The effect on civil aviation of two economic recessions coming within a short time of each other have slowed down the regulatory process, also the procedural statutes within which regulation must work have created delays which are not good for the welfare of aviation. It is my hope that regulation will now have a breathing spell in which to stabilize and enunciate policies for the future. Overall, it is my prophecy that the air carrier industry will grow in strength and that regulation will grow in wisdom obtained from past experience.

If you will forgive the pun, this represents a "Boyd's" eye view of the future of domestic civil aviation.

HEALTH NOTES

The increased head-on closure rate of jet aircraft requires a sharp lookout: If you waste seconds deciding what to do . . . it is no longer necessary to take corrective action . . . because you are going to be straining yourself unnecessarily and are going to die all tensed up!

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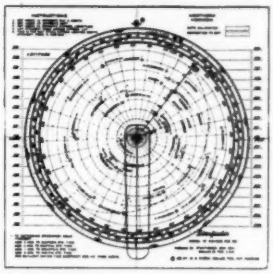

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